Bull. Org. mond. Santé
Bull. Wld Hlth Org. } 1956, 14, 249-262

THE MODERN DIAGNOSIS OF SYPHILIS

SIDNEY OLANSKY, M.D.
Department of Medicine (Dermatology), Duke University, Durham, N.C., USA

I. N. ORPWOOD PRICE, M.R.C.S., L.R.C.P., D.P.H.
Director, Venereal Diseases Reference Laboratory, (Public Health Laboratory Service) The London Hospital Research Laboratories, Whitechapel, London, England

SYNOPSIS

After briefly outlining the natural history of syphilitic infection, the authors review in detail the diagnosis of syphilis in the various stages of the disease and discuss the relative value at each stage of the commonly used serological tests and the *Treponema pallidum* immobilization (TPI) test. In their conclusions, they remark that the TPI test should be used with discretion and not as a matter of routine with all sera. Owing to its complexities and to the lengthy procedure involved, it is better suited for use with "problem" sera, for instance, sera from expectant mothers suspected of being acute non-treponemal reactors, or sera from persons with latent syphilis.

The success of a venereal disease control programme is ultimately dependent on case-finding. The most widely used case-finding tool is the serological test for syphilis, which serves to bring the syphilis suspect to diagnostic facilities. These serological tests are often used as a routine procedure not only with the usual hospital intake, including expectant mothers, but also in mass surveys of the population. Once the patient can be brought to the diagnostic clinic, expert diagnosis will complete the circuit, determining the need for treatment and the necessity, if any, of contact tracing. On the other hand, it must not be forgotten that small outbreaks of obvious clinical syphilis still occur from time to time, as for example, one which happened in the State of Georgia, USA, during the latter part of the year 1953. On this occasion an individual rejected by his draft board was diagnosed as having secondary syphilis. As a result of contact tracing and interviewing, approximately 70 cases of primary and secondary syphilis were detected. This work was performed by four full-time investigators with the occasional assistance of two others. In addition, approximately 200 other patients were treated prophylactically because they had been exposed to syphilis and enough man-power was not available to

apply the proper follow-up procedures to these people. All this occurred in a period of six weeks (see Fig. 1).

Advances in the diagnosis of syphilis during the last few years have been made primarily in the serology of the disease. The main changes are refinement and standardization of technical methods, the development of tests using cardiolipin antigens, and the introduction of tests employing *Treponema pallidum* as antigen, such as the *Treponema pallidum* immobilization (TPI) test, the *Treponema pallidum* agglutination (TPA) test, and the *Treponema pallidum* immune adherence (TPIA) test. At the same time while clinicians, in general, show an ever-increasing awareness of the possibility of syphilis when dealing with patients and realize that the pattern of the disease is still changing, their publications seem to indicate that their main interest is focused on treatment. Therefore it seems that a short review of the diagnosis of syphilis, including the present position of serological tests, might be desirable.

Natural Course of Syphilis

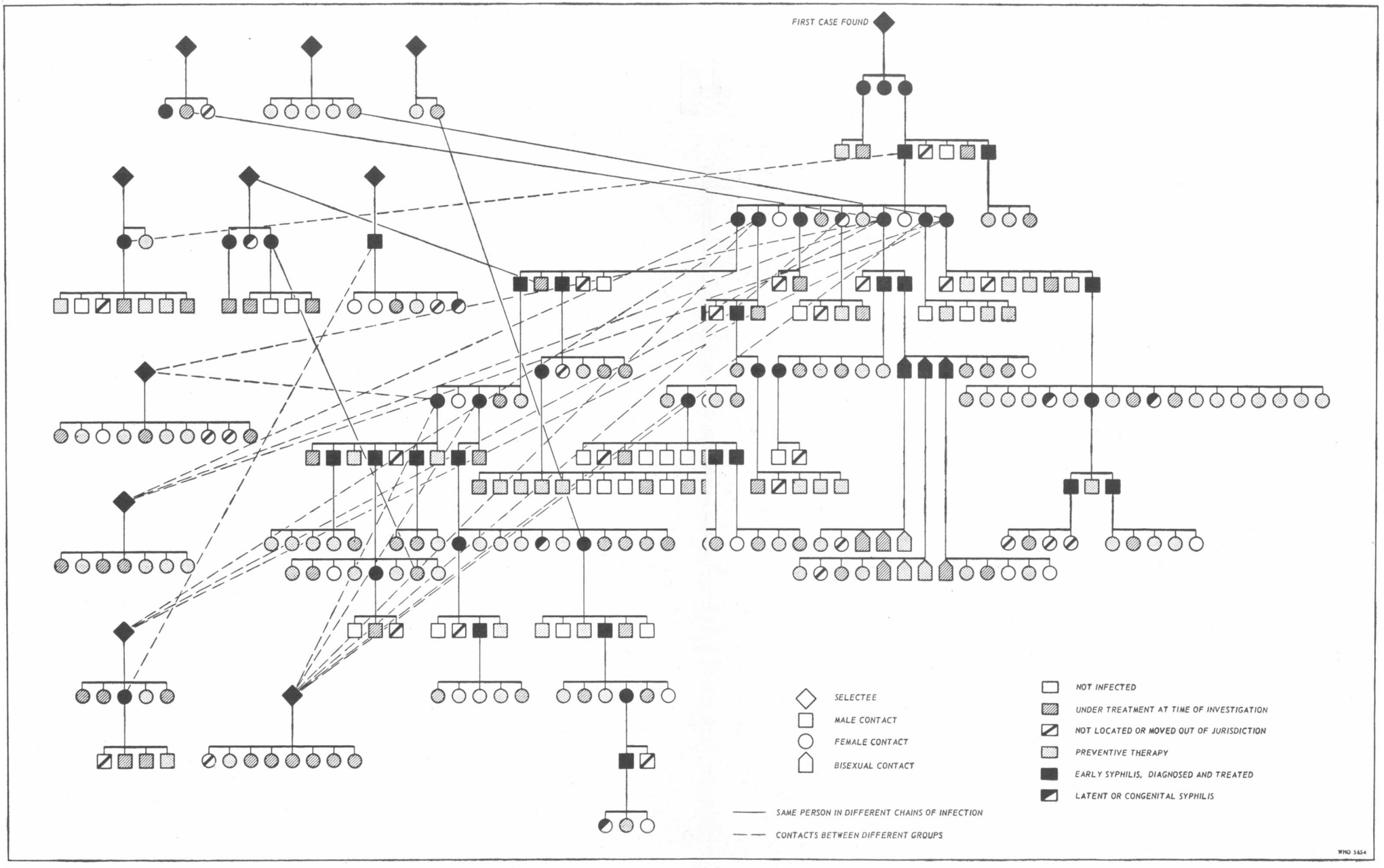
In order better to understand the following discussion a few preliminary observations on the natural history of syphilis may be helpful.

When a patient is first infected with syphilis there is no clinical or serological evidence of the disease. Approximately three weeks after infection a chancre may appear, but at this time the serological tests for syphilis may be negative. One week or more after the appearance of the chancre the commonly used serological tests for syphilis become reactive and later the TPI test also becomes positive. (It is positive in 50% of primary syphilis.) In nine weeks or so secondary syphilis appears, and at this time all serological tests for syphilis are reactive, the TPI test being reactive in 90%-100% of secondary syphilis.[3] The lesions of secondary syphilis may disappear spontaneously and either signs of late syphilis appear or latency ensue. In these later stages all the serological tests for syphilis are usually reactive, but after many years the commonly used tests may become spontaneously negative in some instances whether the patient has suffered damage such as cardiovascular scars or not. Most of these individuals, however, continue to have positive serological tests for syphilis for life although some may have no clinical evidence of syphilitic damage.[1] There is a suggestion that in some instances the TPI test may become spontaneously negative with time.[a]

Treatment may alter markedly both the clinical course and the serological pattern of the " natural " disease in some stages, and may produce no change at all in other stages. If adequate treatment is given at the onset of the disease the chancre will not appear and the serological tests

[a] C. A. Smith et al. *Untreated syphilis in the male Negro* (to be published)

FIG. 1. RESULTS OF EPIDEMIOLOGICAL INVESTIGATION OF A CASE OF SECONDAY SYPHILIS, TROUP COUNTY, GEORGIA, USA, 17 AUGUST-1 OCTOBER 1953 *



* Reproduced by permission of Dr C. D. Bowdoin, Venereal Disease Control Officer, State of Georgia.

will remain negative. If treatment is given early on in the disease, even if a chancre is still present, the patient's serum reactions may never become positive, either with the usual serological tests or with the TPI test. If treatment is begun when the patient is in the seropositive primary stage the commonly used serological tests will become negative within approximately six months in most instances, and the TPI test, in cases that were reactive at the outset, will usually become negative within nine months to one year. The exception to this rule is in patients who have a reactive TPI test as a result of previous infection and who have become reinfected. The positive TPI reactions tend to persist much longer in these patients.[6] If treatment is given during the secondary stage of syphilis the serological tests for syphilis may become negative within 12-18 months, and the TPI test will become negative within 18 months to 2 years on the average.[2] Treatment *after* the secondary stage has a variable effect, but, as a rule, the earlier in the disease such treatment is instituted the better both clinically and serologically is the response. For example, if early latent syphilis is treated three months after the secondary stage the serological response will be just a little slower than the average for secondary syphilis. On the other hand, if treatment is given 10 years after infection the post-treatment serological decline will be very slow, if it occurs at all. The same is true of late syphilis. If active clinical lesions are present they may improve with therapy, but the serological decline in the blood or spinal fluid will be slow, if it changes at all.

Diagnosis of Syphilis by Stages

Every effort should be made to obtain an accurate history from the patient. Sometimes this is difficult, either because the patient is uncooperative and deliberately misleading in his statements, or because he has a casual attitude to life allied to a faulty memory. The need for a careful and full clinical examination of the patient does not require stressing any more than does the necessity for a first-class pathological service.

Primary syphilis

Although the Hunterian chancre is not common, when it does occur it is usually typical. Every lesion—genital, anal, or perianal—should be examined with a " high index of suspicion ", and syphilis should be ruled out in suspicious cases only after repeated darkfield examination of the chancre and associated glands and full serological testing for syphilis. It should be remembered that a positive darkfield examination is the only test that can establish the diagnosis of syphilis beyond peradventure. If the lesion is darkfield negative it is important to determine whether the patient has received treponemicidal drugs locally or systemically. It is

common practice for people to purchase oral penicillin or penicillin ointment which they administer to themselves on the slightest provocation. The effect of antibiotic treatment of other diseases at the relevant times must also be considered. Such therapy might alter the clinical and serological course of the disease. Any such patients should be followed for at least four months in order to rule out the possibility of infection. In the absence of treatment the primary lesion will heal spontaneously, but this is not cure of the disease. When the primary lesion occurs at a site where the regional lymph-nodes are accessible, a so-called satellite bubo may be discovered. This is generally a large, rubbery, discrete, non-tender node, but the primary lesion may be at a site where these conditions are not fulfilled. Thus a satellite bubo may be present but not palpable. For example, with anal or cervical chancres, the bubo would be inaccessible to the examining finger. The commonly used serological tests for syphilis and the TPI test may be reactive or negative at this stage, depending on the length of time of infection. It should be remembered, however, that the evidence so far suggests that the common serological tests become positive sooner than the TPI test, and that in such cases the latter test offers no advantages over the more usual ones.

At the same time it must be emphasized that in primary syphilis dark-field examination of possible lesions should never be omitted, because if treponemes are found irrefutable evidence of the cause of the infection will have been established.

Secondary syphilis

The clinical manifestations of secondary syphilis are very diverse and show great individual variation. Although they are often associated with constitutional symptoms such as fever and malaise, the diagnosis is made primarily on the basis of lesions of the skin and mucous membrane. The skin lesions may resemble those of other skin diseases, but in acquired syphilis they are never vesicular. Usually they are not pruritic, but this is not always the case. At the same time it should be remembered that scabies or pediculosis may co-exist with secondary syphilis, and as a result a vesicular pruritic eruption may be the presenting symptom. Secondary syphilis is usually associated (1) with papules in areas where the skin is in contact with other skin and is moist and warm, such as the anogenital, submammary, or axillary regions; (2) with mucous patches occurring most commonly in the buccal cavity; (3) with a " moth-eaten " type of alopecia; and (4) with iritis. The bones, and the liver, kidneys, and other viscera, as well as the central nervous system, may also be involved in the syndrome. In such circumstances, changes in the central nervous system are usually detectable only by abnormal findings in the spinal fluid; the cell count and total protein are raised and the serological tests for syphilis are positive.

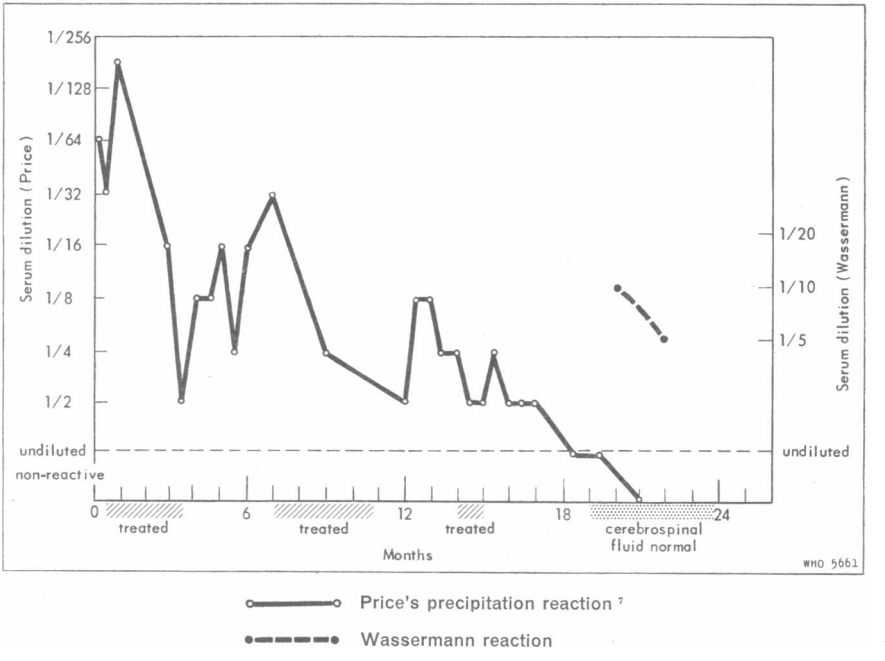
On the other hand, acute syphilitic meningitis may occur. The latter is similar to any other of the meningitides except that it is associated with a positive test for syphilis with spinal fluid. The commonly used serological tests are positive with practically 100% of sera from persons with secondary syphilis and the TPI test is reactive with some 90% of such sera; little evidence has been produced that there is any point in performing a TPI test in secondary syphilis.

Relapse and reinfection

A relapse may occur in early infectious syphilis if inadequate treatment is given for the disease.

Serological evidence of the onset of clinical relapse is often obtained by means of the usual serial quantitative blood testing. An example of this is given in Fig. 2.

FIG. 2. SEROREACTIONS OF CASE OF LATE SECONDARY SYPHILIS WITH HEALED PUSTULAR RASH



It will be noted in this figure, which shows the serological pattern of a treated late secondary syphilitic patient, that two serorelapses occurred (at 7 and at 14 months), both of which were short-circuited by the institution of treatment. However, the general experience is that the majority of so-

called treatment failures are often in fact reinfections. The course of reinfection after the treatment of primary or secondary syphilis usually resembles that of a new infection. An extreme example of this was observed by one of us (S.O.). A patient had primary syphilis in the area of the fourchette of the vulva three times within a year, and on no occasion was a positive serological test for syphilis demonstrated. In each instance the lesion was diagnosed shortly after its appearance and treatment instituted before a serological reaction could develop.

Latent syphilis

Latent syphilis is diagnosed on a basis of positive serological tests for syphilis, a cerebrospinal fluid examination, negative clinical findings, and a past history of syphilis. But the history can be misleading, intentionally or otherwise, and one is often forced to base a diagnosis on whether or not the patient is believed to be a reliable witness. In addition, the diagnosis of latent syphilis may be very difficult nowadays, as a result of the use of antibiotics for so many diseases other than syphilis. Use of these treponemicidal drugs may confuse the issue, and it is sometimes impossible in retrospect to decide whether the patient was or was not infected with *T. pallidum.*

Non-treponemal reactors

A diagnosis of latent syphilis based on the above evidence is reasonable but may not always be accurate. Thus, a patient may be cured of the disease as a result of treatment, but subsequently become a non-treponemal serum reactor. Moreover, non-treponemal reactions (the so-called biologically false positive reactions) occur with the sera of patients who have no historical or clinical evidence of syphilis. They are a source of great trouble, and are associated with upper respiratory infections and vaccination for smallpox, and most probably with pregnancy as well. Furthermore, permanent non-treponemal reactions are seen in leprosy, lupus erythematosus, and haemolytic anaemia as well as other clinical conditions. Fortunately, such patients are mostly *acute* non-treponemal reactors, and can usually be recognized by means of quantitative serial serological tests for syphilis over a period of 3-4 months, by which time the serum reactions become, and remain, negative. The sera of *chronic* non-treponemal reactors may, however, give positive results with serological tests for syphilis for years, and the differential diagnosis between a non-treponemal reactor and a patient suffering from latent syphilis on the basis of reactions to those tests becomes almost impossible. Faced with such a dilemma the clinician should enlist the aid of the TPI test. Moore & Mohr [5] reported that the TPI tests were negative in 45% of such patients, but other workers, such as Wilkinson,[11] do not

agree that the discrepancy in the findings between the commonly used serological tests and the TPI test is so great (5%). The divergencies in these figures can, in part, be accounted for by the relative sensitivities of the different serological tests employed and also by the difficulty of excluding old latent syphilis coupled with the impossibility of examining the relevant members of the families involved. The greatest value of the TPI test may well be the help it gives with sera from expectant mothers who are acute non-treponemal reactors. In such instances time is short, and the psychological effect on such a patient of repeated blood-letting is apt to be extremely disturbing. It must be remembered, however, that it appears that the TPI test may be responsible for a small number of non-specific reactions.[11,12] It therefore seems that it is, at the moment, unwise to assume that the TPI test is absolutely specific. Thus, as far as can be gathered from the literature, in the aggregate, only approximately 2500 " normal " or non-syphilitic sera have been subjected to this test and the occurrence of non-treponemal reactions is in the region of 0.3%. This figure is not far removed from that obtained by one of us (I.N.O.P.) [10] in the routine testing of sera from a venereal disease clinic with the usual serological tests, and it is well above that (0.04%) obtained by blood transfusion services in Great Britain.[a] However, this percentage figure for the TPI test may be misleading, because all the reports are concerned with relatively small batches of sera (350 or less). There does seem to be a lack of precise information on one of the most fundamental aspects of the results to be expected from the TPI test.

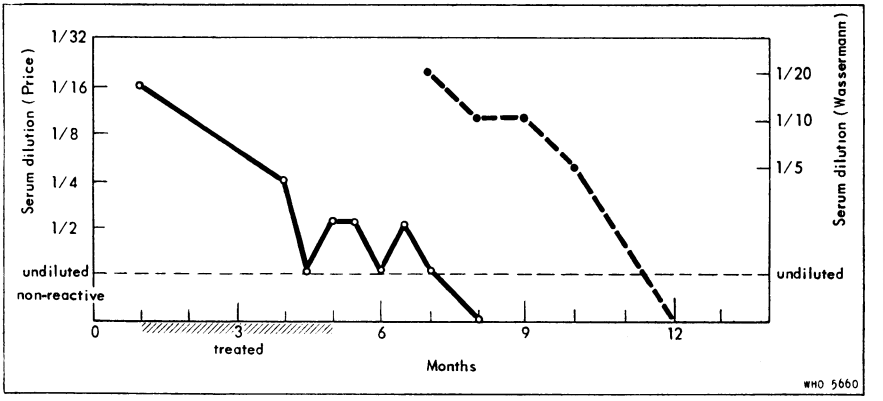
Quantitative serological tests for syphilis

The quantitative serological tests for syphilis may or may not be helpful in diagnosing the stage of syphilis, but they are undoubtedly most useful in determining the serological response to treatment.

Following treatment for early syphilis the serological titres diminish towards negative. If a patient with latent syphilis were treated and his serological titre descended at a rate similar to that expected in early syphilis, it would be reasonably certain that the patient was suffering from early latent syphilis. If the serological titre remained fixed or declined very slowly after treatment, it would be equally certain that the case should be diagnosed as late latent syphilis (see Fig. 3). If, following treatment and a satisfactory serological decline, there were a sudden maintained rise in titre, that might be the herald of a clinical relapse. This may be seen in Fig. 2, where the titre rises steadily for 3 or 4 weeks and a serological relapse occurs. Such a relapse may be the precursor of a clinical relapse unless the patient has become reinfected. In either case early treatment is indicated.

[a] Personal communications (1953) from R. A. Zeitlin, Medical Director, South London Blood Transfusion Centre, Sutton, Surrey, England, and R. Drummond, Medical Director, National Blood Transfusion Service, Cardiff, Wales.

FIG. 3. TYPICAL SEROLOGICAL PATTERN IN A CASE OF UNTREATED LATENT SYPHILIS OF FOUR YEARS' STANDING, DISCOVERED ON ROUTINE TESTING AT BEGINNING OF TREATMENT FOR GONORRHOEA



= Price's precipitation reaction[7]

= Wassermann reaction

An interesting study recently completed, but not yet published, from the Sing Sing Penitentiary in New York State indicates that the quantitative serological tests for syphilis reflect the activity of the disease more accurately than does the TPI test. In human volunteers at this penitentiary there were no changes in the titres with these quantitative tests following inoculations with dead treponemes, but the TPI titres rose. In patients challenged with live organisms, the quantitative test titres increased with infection and the TPI titres increased at a slower rate.

Prenatal syphilis

Prenatal syphilis presents all the problems of diagnosis of syphilis in addition to the problems of pregnancy. It has been said that the pregnant syphilitic infrequently has clinical lesions, but this statement may be too sweeping, because whether the pregnant syphilitic has lesions or not would depend on the age of the infection in relation to the pregnancy. Darkfield positive lesions during pregnancy and at term have been observed with some frequency, presumably because the syphilis was acquired either concomitantly with the pregnancy or sometime after pregnancy resulted, but before term. In such patients early syphilitic lesions are to be expected with about the same frequency as in infected non-pregnant groups. If pregnancy occurs during the latent phase of the disease, lesions of syphilis are not to be expected; the latter group make up the bulk of patients seen in the average prenatal clinic. If a persistent reactive serological test occurs during pregnancy, it is extremely difficult to avoid the diagnosis of syphilis.

As has already been stated (see page 255) the sera of such patients should be submitted to a TPI test, the result of which may well solve the serological problem, apart from saving the patients much psychological disturbance. The decision to treat or not to treat rests squarely on the clinician, and in coming to a conclusion he must balance all the facts, including the history, clinical condition, and serological results, at the same time bearing in mind that treatment of syphilitic mothers, even late in pregnancy, can prevent or cure infection of the child in approximately 95% of cases.

Congenital syphilis

This is syphilis transmitted from the mother to the child in utero. A child with early congenital syphilis may be a very sick child and show manifestations of severe generalized infection with lesions of the skin, mucous membranes, viscera, and bones. The diagnosis is established in the same manner as that of secondary syphilis, that is, darkfield examination of material from the lesions (if any) and serological tests for syphilis. A newborn baby of a syphilitic mother with no clinical signs of the disease except positive reactions to serological tests for syphilis should not be diagnosed as syphilitic without further investigation. It frequently happens that there is a " carry-over " of reagin from the mother's to the child's circulation.[9] In such cases the titre in the mother's serological test is usually higher than that in the child's, and on weekly serial quantitative blood testing, the child's serum titre will drop to negative in about 4-6 weeks. On the other hand, if the child's serum titre shows a steady upward trend a diagnosis of syphilis can be made with confidence. Such a child must be regarded as an early latent syphilitic.

It cannot be too strongly emphasized that the taking of blood from the umbilical cord of infants is not a profitable procedure. Such specimens, when they arrive at the laboratory, are nearly always infected to such a degree as to vitiate precipitation tests and so anticomplementary as to render impossible any useful result by means of a complement-fixation reaction. If it is impossible to obtain blood from a newborn child by venepuncture, a small cut on the heel with a guarded safety-razor blade will usually produce sufficient blood for serological examination.

The following are some of the late manifestations of congenital syphilis: (1) A positive and persistent serological test for syphilis. (2) Interstitial keratitis, which usually begins around puberty but may occur at any time from the age of 8 years. It should be remembered, however, that not all patients with interstitial keratitis have positive reactions to the usual serological tests or to the TPI test. Whether it is to be inferred from these results that this condition is not always due to syphilis has yet to be shown. (3) Clutton's joints, a painless bilateral synovitis, which is frequently associated with interstitial keratitis. (4) Central nervous system syphilis may

develop in the absence of treatment at any time after the infection, and, when it does, it has a tendency to be more severe than that of acquired syphilis. (5) Gummatous lesions or late benign tertiary lesions may appear, as they do in acquired syphilis, but it is interesting to note that cardiovascular disease in congenital syphilis is extremely rare. The stigmata of late congenital syphilis may or may not be present, but when present are very helpful in arriving at a diagnosis. They are the saddle nose, rhagades, Hutchinson's teeth and Moon's molars, and sabre tibia; but many of these signs may be misleading and should be very carefully evaluated. Serological tests for diagnostic purposes of children or adults suffering from congenital syphilis often yield low-titred serum reactions, which require careful interpretation. On such occasions a TPI test is often of great confirmatory value.

Late benign syphilis

Late benign syphilis involves the skin, mucous membranes, and bones most frequently, and occasionally the viscera. In this stage of the disease the high-titred serological reactions sometimes obtained indicate the reaction of the body against the disease rather than the " amount " of the infection. Diagnosis may be difficult and a biopsy is not always conclusive. Nevertheless, the serum tests can be relied on, and a therapeutic test with bismuth and iodides will generally substantiate the diagnosis. In addition, it should be remembered that in bone and visceral syphilis an X-ray examination can be very helpful and sometimes even diagnostic.

Cardiovascular syphilis

In cardiovascular syphilis it is sometimes extremely difficult to know whether one is dealing with the ravages of syphilis affecting the heart or heart disease complicated by a superimposed syphilis. Serological tests may help when the results are positive, but such patients' sera are often non-reactive. In the latter case it may be that the infection has died out and that the symptoms are due to the sequelae of the disease. In a long-term study of a group of untreated male Negroes, it is interesting to note that a diagnosis of cardiovascular syphilis in most instances was not confirmed by subsequent autopsy.[a] On the other hand, many cases of this clinical condition were found at post-mortem examination which had not been diagnosed during life. Uncomplicated aortitis is a most difficult type of cardiovascular syphilis to recognize, and the diagnosis may very often depend on the presence of aortitis accompanied by a positive serological test for syphilis. When a saccular aneurysm of the arch of the aorta or aortic insufficiency is present, the diagnosis can be relatively simple, but

[a] C. A. Smith et al. *Untreated syphilis in the male Negro* (to be published)

unfortunately such a diagnosis is not of a type of disease which can be expected to respond to therapy very adequately.

Neurosyphilis

Neurosyphilis may imitate any neurological syndrome, and the diagnosis must usually be confirmed by laboratory tests. The cerebrospinal fluid laboratory tests, which are of great help, consist of: (1) complement-fixation and precipitation tests for syphilis; (2) cell count, which may be raised above the normal of 10 cells per ml; and (3) total protein count, which may be raised above the normal 30 mg%.

It is a good working rule to remember that the degree (or absence) of active inflammation of the nervous system (usually the meninges) is measurable by the cell count and total protein content, and that the syphilitic cause of the infection, if any, is indicated by the results of the complement-fixation or precipitation tests for syphilis.

Neurosyphilis, however, may be asymptomatic and the only evidence of disease may be found in the cerebrospinal fluid. It has been stated, however, that minimal amounts of reagin can leak from the blood-stream into the cerebrospinal fluid, and there be detected with the complement-fixation test in the absence of any clinical signs or increase in the total protein or cells.

Conclusions

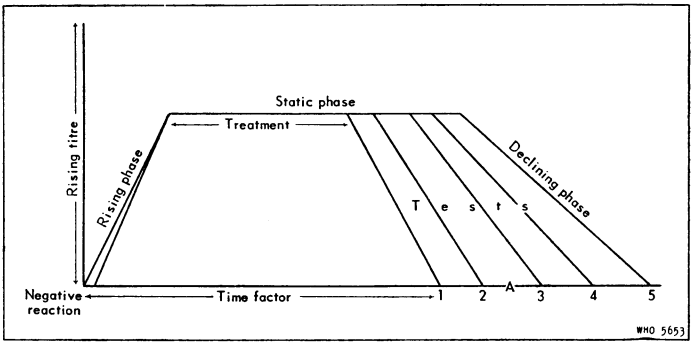
From the above brief outline of the modern diagnosis of syphilis it seems clear that the closest co-operation between clinician and serologist is essential if the patient is to be served to the best advantage. It can also be implied that the clinician must have more than a nodding acquaintance with serological tests for syphilis, and it is of the utmost importance that he should know the relative sensitivity of the tests on which a report is based before attempting to assess the results of any test or group of tests. This may be illustrated by Fig. 4, in which five serum tests are compared.

As can be seen there is little difference in the rising phase of the sensitivity of any of these tests, but a marked difference occurs in the static and declining phase. Thus, if a blood were tested at time-point A, the serologist would report tests 1 and 2 as negative, and tests 3, 4, and 5 as positive. Lack of knowledge of the relative sensitivities of these tests would render the interpretation of such a report difficult.

In addition due attention should be given to the specificity of the tests employed. This is always a difficult assessment, and the relative merits of the various antigens employed in serological tests for syphilis have yet to be settled. Thus, when cardiolipin antigens were first tested, most

authors claimed that these reagents were not only more sensitive but also more specific than the so-called crude heart-extract antigens. Since then, doubts have arisen, and other authors [4, 8, a] aver that while there is no question of the greater sensitivity of cardiolipin antigens, it seems that a greater number of non-treponemal reactions may occur with patients' sera when these antigens are employed.

FIG. 4. RELATIVE SENSITIVITIES OF FIVE SEROLOGICAL TESTS FOR SYPHILIS *



* Reproduced, with modifications, from Price [9] by permission of the editors of the *British Medical Journal*.

Of late, serum tests using *Treponema pallidum* as antigens have been evolved, such as the immobilization test, the immune adherence test, and the agglutination test. The latter two are still in the experimental stage. On the other hand, Nelson's TPI test is already useful, although it has its limitations. As it stands, owing to its complexities and to the time-consuming technique required, it cannot be used as a routine test, and should therefore be reserved for " problem sera ". The position may be summed up as follows:

1. In primary, secondary, and late symptomatic syphilis the results of both the usual serological tests and the TPI test are in agreement and the use of the latter test as a routine procedure is not indicated.

2. The great value of the TPI test in testing the sera of patients suffering from latent syphilis must be emphasized; if repeated TPI tests on different specimens of sera from such patients remain negative the diagnosis is suspect.

3. The TPI test can be of great value, for reasons already given, with sera from expectant mothers suspected of being acute non-treponemal reactors.

4. The TPI test may well prove to be of great value in determining the significance of positive reactions to the commonly used serological tests

[a] S. Shaw—personal communication

obtained with the sera of patients suffering from collagen diseases. Further research is required before firm conclusions are justified.

5. Although the TPI test is highly specific there is evidence that non-treponemal reactions occur.

From the above summary it is obvious that the TPI test should be used with discretion and not allowed to become just another test for syphilis.

In conclusion, it cannot be too strongly stressed that in the diagnosis of syphilis the serologist is the helpmate of the clinician. In order that his efforts may yield the best results, each blood sent for testing should be accompanied by a brief but relevant report on the patient, so that an intelligent interpretation of the serological results can be given. " Slot machine " serology should be eschewed, and the clinician who withholds information deserves the service he gets. Serologists are well aware of the difficulties of clinical diagnosis, and in spite of their own limitations, they are anxious to play their part to the best of their ability. Thus, it is certain that clinicians and serologists are complementary to each other and only while standing in this relationship are they both able to serve the best interests of the patient.

RÉSUMÉ

Les auteurs examinent la valeur des tests sérologiques usuels dans le diagnostic de la syphilis, à ses divers stades et dans ses diverses manifestations, ainsi que celle des tests tréponémiques récemment introduits dans la pratique, en particulier le test d'immobilisation de *Treponema pallidum* (TPI). Ils concluent que le test TPI ne doit pas être considéré comme un simple test de diagnostic venant s'ajouter aux tests sérologiques en usage. Son exécution délicate et lente exclut son emploi comme test courant. Au reste, il n'apporte aucune aide au diagnostic des cas primaires, secondaires ou tardifs avec symptômes cliniques, car il donne les mêmes résultats que les tests sérologiques habituels. En revanche, il revêt un intérêt particulier dans l'examen des sérums pour lesquels le diagnostic est difficile, tels que les cas latents, les cas suspects en période de grossesse, susceptibles de donner avec les tests sérologiques usuels de fausses réactions positives. Bien qu'il soit très spécifique, ce test ne permet pas d'exclure de façon absolue les fausses réactions positives.

La collaboration étroite qui est nécessaire entre clinicien et sérologiste est soulignée par les auteurs. Le clinicien lui-même doit connaître la sensibilité relative des divers tests aux divers stades de la maladie, ainsi que leur spécificité et les marges d'exactitude des résultats qu'ils donnent avec les différents antigènes utilisés.

REFERENCES

1. Bruusgaard, E. (1929) *Arch. Derm. Syph. (Berl.)*, **157**, 309
2. Edmundson, W. F., Kamp, M. & Olansky, S. (1955) *A. M. A. Arch. Derm.* **71**, 384
3. Edmundson, W. F. et al. (1954) *Arch. Derm. Syph. (Chicago)*, **70**, 298
4. Klein, S. J., Konwaler, B. E. & Leiby, G. M. (1954) *Amer. J. Syph.* **38**, 318

5. Moore, J. E. & Mohr, C. F. (1952) *Ann. intern. Med.* **37**, 1156
6. Olansky, S. et al. (1953) *Amer. J. Syph.* **37**, 253
7. Price, I. N. O. (1948) *J. clin. Path.* **1**, 91
8. Price, I. N. O. (1954) *Brit. J. vener. Dis.* **30**, 210
9. Price, I. N. O. (1954) *Brit. med. J.* **1**, 637
10. Price, I. N. O. & Wilkinson, A. E. (1951) *Brit. J. vener. Dis.* **27**, 191
11. Wilkinson, A. E. (1954) *Brit. J. vener. Dis.* **30**, 144
12. Zellman, H. E. (1954) *Amer. J. Syph.* **38**, 506